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Auto- and cross-correlation analysis of the QSOs radio wave intensity

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Abstract

© Published under licence by IOP Publishing Ltd. We discuss here the Flicker-Noise Spectroscopy approach to studying astrophysical systems, for example the radio wave intensity of quasi-stellar object (QSO) 1641+399 and BL Lacertae (BL Lac) 0215+015 in different frequency ranges. The presented method allows to parameterize the study dynamics using a short set of characteristics. The considering sources have a significant differences in manifesting the non-stationary effects, dynamical intermittency and synchronization. The radio wave intensity dynamics of the BL Lac 0215+015 is characterized by well-defined set of natural frequencies, persistent behavior with low effects of non-stationarity and high level of frequency-phase synchronization. For dynamics of the QSO 1641+399 reverse occurs including the asymmetrical structure of cross-correlator. Our findings show that using the flicker-noise spectroscopy approach to studying astrophysical objects allows to carry out the more detail analysis of their behavior and evolution.

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